



Predicting indoor heat exposure risk during extreme heat events

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Abstract:

Increased heat-related morbidity and mortality are expected direct consequences of global warming. In the developed world, most fatal heat exposures occur in the indoor home environment, yet little is known of the correspondence between outdoor and indoor heat. Here we show how summertime indoor heat and humidity measurements from 285 low- and middle-income New York City homes vary as a function of concurrent local outdoor conditions. Indoor temperatures and heat index levels were both found to have strong positive linear associations with their outdoor counterparts; however, among the sampled homes a broad range of indoor conditions manifested for the same outdoor conditions. Using these models, we simulated indoor conditions for two extreme events: the 10-day 2006 NYC heat wave and a 9-day event analogous to the more extreme 2003 Paris heat wave. These simulations indicate that many homes in New York City would experience dangerously high indoor heat index levels during extreme heat events. These findings also suggest that increasing numbers of NYC low- and middle-income households will be exposed to heat index conditions above important thresholds should the severity of heat waves increase with global climate change. The study highlights the urgent need for improved indoor temperature and humidity management.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Indoor Environment, Meteorological Factors, Temperature

Temperature: Extreme Heat

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location:

resource focuses on specific location

United States

Climate Change and Human Health Literature Portal

Health Impact:

specification of health effect or disease related to climate change exposure

Injury, Morbidity/Mortality, Other Health Impact

Other Health Impact: Heat stroke

Population of Concern: A focus of content

Population of Concern:

populations at particular risk or vulnerability to climate change impacts

Low Socioeconomic Status

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content